

SECTION 5 — SITUATION

The situation file, also referred to as the "setup file" or the "scenario file", contains data concerning the number and types of ports, aircraft, ships and other transportation parameters. The situation provides the means for modifying and editing the transportation resources and resource constraints that affect a model analysis. To expedite the analysis process, it may be desirable to maintain a series of situations that reflect various courses of action or various lift allocations. Some degree of situation editing or verification will usually be necessary prior to running a model analysis.

Figure 5-1: Summary Mode; Situation Panel

Various records in the situation specify the speeds, capacities, attrition rates, load and unload times for the ships and aircraft, and the utilization rates to be applied to the aircraft used during model processing. In addition, the situation includes information relevant to the various air and sea ports designated for use in the model. Pertinent port data includes the days required to

assemble the cargo at the POD (marry-up time) and port constraints. The situation file also reflects the status of the Panama and Suez canals (whether they should be considered "open" or "closed" during model runs), the TPFDD date on which to stop model processing, and factors concerning convoy routes.

All values may be edited in DART through the Situation panel in the center of the DART Main Menu screen, available in Summary mode.

Entries in the DART Situation panel are designed to be model independent. Although the system allows editing of every item, not all parameters are applicable to every transportation model available in DART. In the course of identifying the Situation options, this manual will identify the parameters that are NOT applicable to a given model.

The first step in preparing a situation is either to select a default situation for modification, or to create a new situation. Selecting the "New Situation" option, from the menu activated from the File button on the DART Main Menu, displays a pop-up requiring verification that this is the path desired. When this path is chosen, all capabilities must be defined. Select OK to continue or Cancel to return to File selections. Editing a situation may be easier than creating a new one because input or changes may not be required for all data items in a previously established situation. Time required to create a new situation will depend on the complexity of the transportation allocations and assets. When "Open Situation" is selected from the pop-up menu under the File button, a list of names of pre-stored situations is displayed. Behind each of the pre-stored situations is a status in []. The term "loaded" refers to any situation that has been retrieved and loaded in memory in the current DART session. "Personal" situations are only accessible through the currently logged in User ID. Situations listed as "public" are available to everyone. Once a "public" situation is changed and saved, the original remains in the public directory and the modified copy becomes a "personal" situation. To transform a "personal" situation into a "public" situation, see the System Administrator. Highlight a situation name and press the left mouse button. The situation name will appear in the Analysis Information Panel when the situation has completed loading. (A TPFDD need not be loaded at this point in processing.)

At any time during a DART session, a different situation can be loaded from the menu under the File button or by highlighting the situation line in the Analysis Information Panel. Either path will produce a pop-up list of situation names to select from. (See Section 5.7 on saving the situation.)

The following paragraphs explain how to use the options in the Situation panel to edit data contained in a situation file.

Figure 5-2: Verify Selection of New Situation

5.1 AIRCRAFT CAPACITY

Detail information regarding aircraft allocations and characteristics can be accessed and modified using the "Edit Characteristics" and "Edit Allocations" buttons in the Aircraft Capacity portion of the Situation panel. The following paragraphs explain how to edit aircraft data. All data fields can be accessed by highlighting the desired option and pressing the left mouse button.

5.1.1 Edit Aircraft Characteristics

Selection of "Edit Characteristics" for aircraft activates a pop-up with a list of all aircraft utilized in the situation (that is, aircraft already included in the situation) and an additional option to add a New Aircraft Type. If a new aircraft type is desired, the system will prompt for the name of the new aircraft type before proceeding. Cancel the function or type in the new aircraft name and press < RETURN> , followed by OK. Selection of a given aircraft type, or addition of a new type, from this pop-up activates a subsequent window that allows revision of detailed information about a specific type of aircraft. Review and change characteristics, as applicable, and select OK.

Note: The system will accept any name but the use of standard aircraft type names is advised.

Notice the small box symbol next to items under Cargo Parameters and Cargo Time Parameters. This is a "detail symbol" and it is there to indicate that further detail exists for that data element. If the symbol is small, the detail is not currently in view. Clicking the left mouse button on the symbol will cause it to expand, and bring the detail into view. Clicking on the expanded symbol will cause it to contract and hide the detail data. When multiple areas are expanded, the bottom of the window scrolls down and out of view. Use the right and left mouse buttons to scroll on the gray bar on the left of the pop-up to bring information back into view.

Figure 5-3: Aircraft Characteristics

To edit aircraft characteristics, highlight the value of a data item and click the left mouse button. Type the new data and press < RETURN> . When a string of information, such as utilization rates, requires editing, highlight the string and click the left mouse button. The data can now be edited as follows:

- To insert a new C-Day Utilization Rate, type "Cm:n" where m is the new day, and n is the number of hours of utilization to establish as the fleet average. (Example: C3:12, means that on average, each aircraft will fly for 12 hours on day 3.)
- Existing values must be edited using the following cursor controls:
 - < CONTROL> - f Moves forward a character.
 - < CONTROL> - b Moves back a character.
 - < CONTROL> - a Moves to beginning of line.
 - < CONTROL> - e Moves to end of line.

- < CONTROL> - d Deletes the next character after the cursor.
- < CONTROL> - k Erases (kill) from cursor position to end of line.
- < DELETE> Deletes a character at a time from right to left.

Press < RETURN> when editing of a string is complete. When all required changes are complete, select OK to continue.

Note: The PFE model does not recognize the Prepare for Overseas Movement (POM) Days or Days to Marry Up options in "Edit Characteristics" for Aircraft Capacity.

5.1.2 Edit Aircraft Allocations

Selection of "Edit Allocations" for aircraft activates a window that allows the edit of information reflecting the number of aircraft allocated, by C-Day, in the current situation. This pop-up refers to the aircraft allocations as "timeseries".

To edit the number of a specific aircraft allocated, highlight the timeseries associated with that aircraft and click the left mouse button. This data can now be edited using the editing rules provided in Section 5.1.1. An aircraft type can be effectively removed from the situation by deleting the timeseries or by entering only one timeseries of C0:0. Press < RETURN> when editing of the timeseries is complete, and select OK. While the aircraft type name remains in the list, it is ignored by the model.

Figure 5-4: Aircraft Allocations

The entries in the timeseries are additive in that the 10 C141B aircraft entered on day 10 will be added to those 75 available on day 0 for a total of 85 C141B aircraft. The values entered must be positive integers. To decrease the quantity of aircraft available, a second entry of the aircraft type is needed. The "LRWC and "LRWP" entries reflect this. In addition, the first aircraft must have its Utilization (UTE) Rate set to zero for the effective (and following) dates.

5.2 SHIP CAPACITY

Detail information regarding ship allocations and characteristics can be accessed and modified using the "Edit Characteristics" and "Edit Allocations" buttons in the Ship Capacity portion of the Situation panel. The following paragraphs explain how to edit these data. All data fields can be accessed by highlighting the desired option and pressing the left mouse button.

5.2.1 Edit Ship Characteristics

Selection of the "Edit Characteristics" for ships activates a pop-up with a list of all ships utilized in this situation (that is, ships already used in the situation), and an additional option to add a New Ship Type. If a new ship type is desired, the system will prompt for the name of the ship before proceeding. Cancel the function or type in the new ship name and press < RETURN> followed by OK. Selection of a given ship type, or addition of a new type, from this pop-up activates another window that allows revision of detailed information about a specific type of ship. Review and change characteristics, as applicable, and select OK.

Note: The system will accept any name but the use of standard ship type names is advised.

Notice the small box symbol next to items under Cargo Parameters and Cargo Time Parameters. This is a "detail symbol" and it is there to indicate that further detail exists for that data element. If the symbol is small, the detail is not currently in view. Clicking the left mouse button on the symbol will cause it to expand, and bring the detail into view. Clicking on the expanded symbol will cause it to contract and hide the detail data. When multiple areas are expanded, the bottom of the window scrolls down and out of view. Use the right and left mouse buttons to scroll on the gray bar on the left of the pop-up to bring information back into view. When all required changes are complete, select OK to continue.

The PFE model does not recognize the following "Edit Characteristics" options for Ship Capacity:

- Transfer and Convoy Policy
- Cargo Capability (aka Cargo Restriction)
- STON and SQFT capacities (only MTONs are used in this version)
- POM Days
- Days to Marry Up
- Load Configuration
- Discharge Constraints.

Figure 5-5: Ship Characteristics

5.2.2 Edit Ship Allocations

Selection of the "Edit Allocations" for Ship Capacity displays formatting options for editing the number of ships apportioned to the current situation, and the date they are available. All ship allocations are established by port, and by ship type for each port. Consequently, the formatting options are either to show details by ship type, for each/all port(s); or to show detail by port, for each/all ship type(s). The display of ships for all ports, and ports for all ships reflect totals and cannot be edited. Editing must be accomplished by selecting either ships by specific port, or port by specific ship.

To edit the number of ships for each ship type, by C-Day, in a specified port, select Ship Types and then All Ports/Nodes and select a port name from the subsequent list. Highlight Edit Allocations and press the left mouse button to begin modifications of this data.

To edit the number of ships by port, by C-Day, for an individual ship, select Ports/Nodes and then All Ships and select a ship name from the subsequent pop-up list. Highlight Edit Allocations and press the left mouse button to begin modifications of this data.

Figure 5-6: Ship Allocations — Format Options

To edit allocations, highlight the timeseries and single click the left mouse button. The data can now be edited using the rules listed in Section 5.1.1. Press < RETURN> when editing the timeseries is complete. When all editing is complete, click the left mouse button on Done Editing (see Figure 5-6) and the changes will be saved.

The Display All Ports and Display All Ships options allows allocating a new ship to an existing port or making an initial allocation to a port.

Figure 5-7: Ship Allocations

Figure 5-8: Port Allocations

5.3 PORTS/NODES

This section from the Situation panel displays the number of air POE nodes, sea POE nodes, air POD nodes, and sea POD nodes. The buttons provided in this portion of the screen allow editing of node capability and default nodes.

5.3.1 What is a Node?

To understand fully the options available, first understand the "node" concept. Various TPFDD POEs/PODs are combined into one or more notional POEs and PODs that are then referred to as nodes. While the RAPIDSIM model software will compute closure from individual POEs to PODs, the transportation assets can be used more efficiently if the requirements are aggregated to a select few onload and offload locations. Also, it may be advantageous for transportation analysis to use an arbitrary location as an artificial onload or offload location. These two options are made possible through the use of nodes.

For example, it is possible to have 20 different locations in the Southeastern United States designated as air POEs (APOE) in the TPFDD. From an analysis standpoint, however, it may be more efficient to use only one airfield (Charleston AFB, South Carolina, GEOLOC DKFX, for instance) as an APOE for all of these movement records. Instead of manually changing all the TPFDD or movement records to indicate a POE of "DKFX", simply designate Charleston AFB as an APOE node and then instruct DART to automatically assign the adjoining APOEs to the aggregated APOE node, Charleston AFB.

The PFE model has a switch so that PFE can be executed using either DART/RAPIDSIM notional ports or individual ports.

5.3.2 Nodes Parameters

Selection of "Edit Nodes", from Port/Nodes, displays a list of air and sea nodes available in the specified situation. Each location in the list is mouse sensitive. Highlight and click on a location and a subsequent pop-up allows editing of cargo parameters for the node. Node Parameters are also available from the map's "Edit Node Parameters" option. See section 5.6.3.2.

Note: Nodes cannot be ADDED or DELETED from this DART location; nodes are created and deleted using the Map display.

Note: PFE also recognizes the "Edit Nodes" parameter options and model results will reflect the values entered in the "Cargo Amount Capacity" option. The comparison of these values to simulated deliveries and port requirements may be viewed by the Port Workload graphs available from the Map and Capacity icons.

Figure 5-9: Edit Node Parameters

Only the following parameters are recognized by the current RAPIDSIM model:

- Air-POE - None of the parameters regarding this node are recognized.
- Air-POD - Loc Time (Days of delay, by commodity type, to be added to computer-derived closure date)
 - Max Sorties per day
- Sea-POE - Cargo Capability (Whether port can handle Container, RO/RO, or Breakbulk cargo)
- Sea-POD - Loc Times (Days of delay, by commodity type, to be added to computer-derived closure date).

5.3.3 Edit Default Nodes

Selection of the "Edit Default Nodes" button activates a window that allows the edit of the default port for each type of node, air POE, air POD, sea POE, and sea POD. One of each type must be provided. The system will utilize a default if no node of that type is specified in Node Parameters. PFE and RAPIDSIM use default nodes to fill in missing POE or POD geographic codes when records with missing codes are used to generate movement requirements. See Sections 6.1.2 and 6.3.2 for information on Model Settings.

5.4 ROUTES

This option is not yet available.

5.5 CANALS

The last options in the Situation panel are used to designate a canal as either "open" or "closed". Single click the left mouse button on the appropriate circle to change the status of either the Panama Canal or the Suez Canal. A solid circle indicates a positive selection for the corresponding choice.

5.6 SITUATION EDITING IN MAP MODE

Information about nodes can be added and modified directly from the DART map. The maps are accessed through the Map icon, from the Main Icon Bar, and reflect the node setup scheme established in the Situation edit process as well as the actual ports from the specified TPFDD, if a TPFDD was selected. Consequently, the node and port changes made in Map mode directly change the situation data. The following paragraphs detail map capabilities.

Figure 5-10: Port and Channel Display Map

Note: This map is completely separate from the TPFDD Editor map.

5.6.1 Map Symbols

A map of the selected geographical area appears with ports and nodes symbolized with a color coding scheme. The colors represent variations of information on actual ports (from the TPFDD) and nodes (from the situation). The following table explains the colors and shapes used to represent actual ports and nodes:

<u>Scheme</u>	<u>Data Field Represented</u>
Magenta Square	Origin
Orange Square	POE
Yellow Square	POD
Turquoise Square	Destination
Purple Square	ILOC or Unassigned Port (a location that does not exist in the TPFDD but has been added to the display using the Add GEOLOC option)
Green Arc above Square	Sea Node
Blue Arc above Square	Air Node
Yellow Bottom of Circle	POD Node
Orange Bottom of Circle	POE Node
Red Bottom of Circle	Both POD and POE Node
Green Line	Represents sea movement between POE/POD notional ports or the node assignments to actual ports.
Blue Lines	Represents air movement between POE/POD notional ports or the node assignments to actual ports.

Routes and points on the map are mouse sensitive and information, such as actual flying and sailing distances, location name, and geographic location code, is displayed in the Mouse Information Panel. Remember that actual locations are shown only if a TPFDD is selected.

5.6.2 Main Menu Bar for Map

Map mode provides access to three additional buttons on the Main Menu Bar, as listed below, and described in the following paragraphs.

- Map Region
- Options
- Zoom.

The first additional button, Map Region, activates a pop-up of geographical regions and allows selection of a location for display. Exit the map by highlighting and clicking the left mouse button on the white square ("kill box") in the upper right corner of the map window, or by selecting another map region. In addition, the icon box (upper left corner of the map window) can be used to save a map region for a simultaneous display with another region.

The second button is Options and this selection activates a window that limits the type of ports and routes for display. Air and sea route displays are particularly valuable since they follow great circle paths, and coastal patterns. In addition, Options allows the display of assignments of actual ports to nodes.

Figure 5-11: Map Display Options

The last button provides a Zoom feature with the same capabilities detailed as follows in Paragraph 5.6.3.1.

5.6.3 Map Pop-Up Menus

Pop-up menu options are available directly on the map using the left and right mouse buttons. The following paragraphs explain these options in detail.

5.6.3.1 Map Functions. To access a list of map functions available on the map, single-click the right mouse button anywhere on the black background of a map when no items are highlighted.

This will access the following list of options:

- Add GEOLOC
- Center On A point
- Crosshairs
- Edit Map Options
- Redisplay Map
- Zoom In About Center
- Zoom In About Point
- Zoom Out About Center
- Zoom Out About Point.

Highlight any option and select it by clicking the left mouse button.

If an additional geographic location is required but does not appear on the map, because it is not listed as a port in the current TPFDD, select Add GEOLOC from the map functions pop-up. The results of this selection will be a pop-up of geographic information for a default location, Cambridge, Massachusetts. Click the left mouse button on the GEOLOC line (i.e., Cambridge, Mass (CXUV) Reserve Training Center), type in the desired geographic location code, and press < RETURN> . The information for the new location code will replace the Cambridge data in the pop-up. Verify that this is the location intended and mouse click on OK to proceed. Any location contained in the GEOLOC file, i.e., any point with a GEOLOC code, can be added to the map. Add GEOLOC will display all locations by automatically turning on the "Any" option.

Note: The added location will appear on the map in its proper geographical location as a purple square. To make the location a node, see Paragraph 5.6.3.2, Edit Node Status.

Select Center On A Point from the map functions and a blinking crosshair symbol will appear on the map. Use the cursor to position the crosshair on the location desired as the new center point for a map display. Click the left mouse button and wait for the map to be repainted.

This selection activates the Crosshairs symbol that can be used to locate the latitude and longitude of a location on the map. As the mouse is moved across the map, the latitude and longitude is displayed in the Mouse Information Panel, located directly under the Main Menu Bar. Click the left mouse button to terminate the crosshairs. (Crosshairs can also be activated by clicking the left mouse button directly on a black background.)

Edit Map Options activates a window that allows the user to limit the type of ports and routes to display, and allows the display of node assignments. This is the same window that is activated by the Options button on the menu bar.

Select Redisplay Map to refresh the geographical portion of the screen.

Zoom In About Center repaints the screen to show more detail of the screen's center. Note: Zooming in more than five times may result in a system error.

Zoom In About a Point repaints the map with the selected point shown in more detail.

Note: Zooming in more than five times may result in a system error.

Zoom Out About Center repaints the screen to include the outer areas of the present geographical location. The screen is shown in less detail.

Zoom Out About a Point repaints the screen to include the outer areas of the present geographical location. The screen is shown in less detail with the new center being the selected point.

Figure 5-12: Add GEOLOC

5.6.3.2 Node/Port Functions. To access the list of node and port functions available on the map, single click the right mouse button on a port or node location on a map. A node does not have to be a port used in the TPFDD. In fact, the air or sea node does not have to be an airport or seaport. If a desired node is not listed in the TPFDD, first see the previous section for instructions on how to add a GEOLOC to the map and then use node/port functions to make the new location into a node.

The node/port functions provide the following capabilities:

- Describe Object
- Edit Node Parameters (Only available if location is a node)
- Edit Node Status
- Show Port Workload.

To view a description of a port, single-click the left mouse button on Describe Object. The result is a pop-up window of GEOLOC information for the location. The same result will occur with a single click of the left mouse button directly on the port or through the procedures for adding a GEOLOC to the map

Edit Node Parameters is only available if the location has been assigned as a node in the situation. This function produces a window that allows editing of node parameters. These

parameters can also be edited through the interface available in Summary mode. See Paragraph 5.3.2 for the parameters available for RAPIDSIM. PFE does not recognize changes made to parameters using this function.

Edit Node Status will create a node from an actual port or allow editing of the type of node the port has been assigned to represent. The choices are:

- Air POE Node
- Sea POE Node
- Air POD Node
- Sea POD Node.

A location can be assigned to be all or none of these representations, regardless of its actual port type. The map display will be revised and repainted to reflect the changes made to these nodes.

Select Show Port Workload to display a graph showing:

- Port Capacity Values entered from "Edit Port Parameters" Cargo Amount Capacity
- Port Requirements Aggregate TPFDD Requirements
- Port Load Simulated onload/offload activity.

These items are plotted on a scale of total tons per C-Day.

Note: A TPFDD must be selected and loaded before a Port Workload graph can be drawn.
This option is only available with the PFE model.

Figure 5-13: Port Workload Graph

5.7 SAVE SITUATION

A DART situation can be created or modified and a model can be executed without first saving the situation. However, if the situation should be retained, remember to save the situation before exiting DART. This is accomplished by selecting "Save Situation" from the File menu on the DART screen. DART requires a filename for the situation and will prompt with the following:

Name of Situation :a string
OK Cancel

Single click the left mouse button on a string to enter the name of the situation. Single click the left mouse button on Cancel or on OK to proceed with the save. The situation name entered will subsequently be displayed on the Select Setup menu.

The situation can also be saved as part of an Analysis.

SECTION 6 — TRANSPORTATION MODELS

DART takes advantage of transportation simulation models developed by other projects. The original RAPIDSIM was developed as a stand-alone model that primarily supported the Joint Staff in achieving simulation of movement of combat and support units required for a contingency operation. A version of this RAPIDSIM has now been integrated with DART. The PFE is another DART integrated transportation simulation model. PFE is a dispatch rule simulation of military transportation movements that was developed to support research and development efforts under the DARPA/Rome Laboratory sponsored Transportation Planning Initiative. DART provides a user friendly "front end" for easier entry of transportation asset information and output analysis. In addition to DART RAPIDSIM and PFE, files can be formatted in DART for transfer to JFAST. A generic DART model process is shown in Figure 6-1.

6.1 RAPIDSIM

RAPIDSIM is a deployment simulation model available in DART. RAPIDSIM provides the user with a gross estimation of air and sea transportation feasibility with closure profile estimates for force and resupply requirements. The model consists of input files, a processing program, and output data. The RAPIDSIM process begins with a TPFDD obtained from JOPES, and possibly modified by the DART TPFDD Editor, and proceeds through the building of user established transportation variables, in the Situation, to system execution and output analysis.

The results of RAPIDSIM runs are heavily dependent upon the setup parameters, which cover a wide set of factors. Some parameters concern specific vehicles and ports and are changed from the Situation panel (see Section 5); and some parameters are unique to the RAPIDSIM model and are changed from the Model panel, shown in Figure 6-2. Both are accessed from the Summary mode, activated from the Main Icon Bar.

Figure 6-1: Model Process Overview

Figure 6-2: Model Panel

During RAPIDSIM execution the TPFDD movement requirement records are simulated for flow, based upon the transportation situation and model settings, to produce output data in the form of a history file. When RAPIDSIM processing terminates, portions of the history file are presented for analysis. A pre-determined selection of data in the history file is presented in graphic form by clicking on the Results icon on the Main Icon Bar and selecting the graph to be viewed.

While using the RAPIDSIM application of DART, the planner analyst and decision-makers should remember that the analyses developed here are based on the planned TPFDD movement requirements, as a group, and not on execution schedules that track each ship or aircraft movement. RAPIDSIM does not produce or verify lift schedules and the results do not equate to specific missions.

Descriptions of the functions required to prepare the input, execute the RAPIDSIM process, and analyze the RAPIDSIM output are provided below. Further details on RAPIDSIM setup and operation can be found in supporting RAPIDSIM specific documentation.

6.1.1 RAPIDSIM Input

Two files provide the inputs to RAPIDSIM:

- The TPFDD, i.e., movement requirements, describe the units and cargo to be moved within the environment described by the scenario data, or Situation as it is called in DART. The TPFDD Editor, explained in Section 4, can be used to edit the TPFDD file.
- The Situation data provides the RAPIDSIM model with the environmental characteristics of the simulation problem. In general, the Situation data is viewed as the "how" and the movement requirements data is viewed as the "what" in a simulation problem. One set of Situation data is required for a single simulation run. Several sets of movement requirements data may be associated with one set of Situation data, and vice versa. See Section 5 of this manual for guidance on setting up the Situation parameters.

6.1.2 Model Settings

In the upper portion of the Model panel is the "Edit Model Settings" button. This button produces a window, shown in Figure 6-3, that is used to adjust the parameters used for running RAPIDSIM. Some options can be changed by clicking the left mouse button on the option and typing the desired parameter, followed by pressing < RETURN> . Other fields are changed by clicking on them and selecting an option from a subsequent pop-up window. Modify the settings and limits on this list to alter model run results and produce analysis data streamlined to a given transportation situation.

"Edit Model Settings" options are discussed below. Changing a response to an item may require clicking the left mouse button on the desired answer, clicking the left mouse button on the default value, typing in another value, and pressing < RETURN> , or clicking the left mouse button on an item and making a selection with the left mouse button from a subsequent pop-up menu.

- The default Simulation Start Day is day 0 and the default Simulation Stop Day is 120. Change these limits to satisfy analysis requirements.
- Specify units of measurements (MTONs, STONs, or Square Feet) for ships. The option selected will be used to simulate loading ships based on the corresponding values found in the "Edit Ship Characteristics" option of the Situation panel.
- When records with missing ports are not excluded, the computer will substitute a default port from those specified in "Edit Default Nodes", from the Situation.

Figure 6-3: Model Settings

- Limit the situation to one or more FMs with the "Force Modules to Include" option; only the FMs specified will be included in the flow. To revert to the entire TPFDD, select the "Include All Units in the TPFDD" option.
- The transportation source and mode can be limited by highlighting the fields and selecting options from a subsequent pop-up menu. Normally, strategic transportation analysis is limited to MAC (air) and MSC (sea) responsible movements.

Others may be analyzed through this option.

6.1.3 Movement Requirements

Requirements from the TPFDD are aggregated and converted for RAPIDSIM-readable format with the "Generate Requirements" function. If this option was performed previously, the button would be "Update Requirements".

When the update process is complete, the total cargo and passenger quantities air and sea requirements are available in the Movement Requirements portion of the Model panel. The "MR Report" can now be viewed or printed to identify warnings and errors that may impact model results. See Section 8 for additional information on model reports.

6.1.4 Run RAPIDSIM

RAPIDSIM execution is activated by selecting the "Run RAPIDSIM" option on the Model panel. A prompt will be provided to allow the entry of a name for the model run and any desired descriptive comments. A default model run name, derived from the system date and time, will automatically appear in the window. Single click the left mouse button on a string to enter data. The string fields are optional entries. To execute RAPIDSIM, select OK.

RAPIDSIM accepts and processes the movement requirements in the order they were read from the file prepared by DART. This is normally a priority sorted order based principally on the LAD, or latest arrival date. Once a unit has been selected for deployment, RAPIDSIM simulates the movement of the unit by its specified mode in order to project its delivery at the POD. If the mode was not specified in the movement requirement, the mode that will result in the earliest delivery is used. Each movement requirement is processed until entirely deployed or the duration of the model run is exceeded.

For each movement requirement in the pre-sorted order, RAPIDSIM repeatedly assigns cargo to ships or aircraft (depending on the transportation mode for that unit) in an effort to simulate its actual movement. The fastest un-allocated ship that will move the cargo, and partially loaded ships that will arrive at the unit's POD are compared, and all, or as much of the cargo as possible, is placed on the ship that will arrive soonest. Aircraft are treated similarly in this regard.

6.1.5 RAPIDSIM Results

After the RAPIDSIM run concludes, the lower portion of the Model panel displays a statistical summary of RAPIDSIM results of the simulation run. See Section 7 for information on how these results can be graphically displayed.

6.1.6 TFE

RAPIDSIM can be executed with the TFE (Transportation Feasibility Estimator) flag set. Select TFE from the pop-up activated from the Model button in the Analysis Information Window or from the File button in the Main Menu Bar. When the TFE option is selected, all RAPIDSIM algorithms will be used with the exception that the EAD (vice ALD) will be used as the earliest possible delivery date during the simulation.

6.2 JFAST

The JFAST model cannot be directly accessed from DART at this time, but a TPFDD which has been manipulated in DART can be exported from DART in a format suitable for use by JFAST. The option to "Export TPFDD from DART Database" is on the pop-up menu activated by selecting the File button on the DART main menu. This action will activate another window prompting for the format to export the file in. Select "FAST Input Format" and proceed.

See the DART System Administrator to proceed with the transfer of files from the DART storage hardware to the JFAST computer.

6.3 PFE

The PFE is a day-by-day simulator designed to produce results consistent with those of RAPIDSIM, and in a comparable (even somewhat less) time. The process for preparing and executing the PFE simulation model in DART is identical to the process for RAPIDSIM, with the exception of selecting PFE as the model.

As in RAPIDSIM, the planner analyst and decision-makers must remember that the analyses developed in PFE are based on the planned TPFDD movement requirements, aggregated as a group, and not on execution schedules that track each ship or aircraft movement. PFE does not produce or verify lift schedules and the results do not equate to specific missions.

This model uses two similar but distinct algorithms, one for simulating sealift and the other for airlift. The air and sea simulators are run separately and a model run can be limited to one or both simulators.

Aircraft are treated as aggregate capacities in RAPIDSIM and PFE with some number of each type of aircraft available each day, for some number of hours each day, doing continuous round trips between a POE and POD. Essentially, PFE allocates whole numbers of aircraft of a type to each channel each day from a central pool of aircraft, as it is faced with demand from movement requirements needing transport along channels. In PFE, once aircraft are assigned to a channel for the day to meet some demand, that channel has all of the throughput capacity of that integral number of aircraft for that day. PFE is somewhat more likely to utilize aircraft at less than full capacity, although only one aircraft per channel per type can be under utilized.

Ships are made available (individually) at specific notional ports, called "port groups", on specific days. Thereafter, they can be recycled once they have taken a load to a POD.

The results of PFE simulations are dependent upon the setup parameters. Some parameters concern specific vehicles and ports and are changed from the Situation panel (see Section 5); and some parameters are unique to the PFE model and are changed from the Model panel. Both panels can be accessed from the Summary mode and activated from the Main Icon Bar.

Descriptions of the functions required to prepare the input, execute the PFE process, and evaluate the PFE output are provided in the following paragraphs.

Following the conclusion of PFE execution, output data can be displayed in graphs identical to the RAPIDSIM graphs. In addition, PFE output data can be analyzed in a force module graph provided through the Timeline button displayed in the DART Main Icon Bar. Finally, simulated port workload, requirements, constraints, and the simulated flow through individual nodes may be graphically compared from the map.

6.3.1 PFE Input

The same two file types that provide input to RAPIDSIM also provide PFE input. These files are the TPFDD and the Situation data. The TPFDD (i.e., movement requirements) describes the units and cargo to be moved within the environment described by the Situation. The situation data provides the PFE model with the environmental characteristics of the simulation problem.

Situation data is a large collection of variables and constraints on the assets (ships and airplanes) to be used in a simulation run. The situation file lists the set of notional ports involved, and the availability (allocation) and the capacities of each ship and airplane type. Aircraft capacities are specified by commodity types and are measured in STONs. Ship capacities are entered separately for MTONs, Square Feet, and STONs for each commodity type carried by each ship type. See Section 5 for guidance on setting up the situation parameters for a simulation.

6.3.2 Model Settings

"Edit Model Settings" is found in the upper portion of the Model panel. This button produces the PFE window, shown in Figure 6-4, to adjust the parameters used for running PFE. Modify the settings and limits on this list to alter model run results and produce analysis data streamlined to a given transportation situation.

The PFE model parameters window is divided into two parts by lines of instruction. The top half of the pop-up starts with, "Note: After changing any of the following parameters, you must do Generate Requirements before you run the PFE model." This means that the options in the first half of the window are used by PFE software to generate movement requirements. Consequently, changes to any of these options must be followed by execution of "Generate Requirements", discussed below in Paragraph 6.3.4, before subsequent executions of PFE. The bottom portion of the PFE parameters window begins with the statement, "Note: The following parameters can be changed at any time before doing 'Run PFE'." This means that these selections can be altered without having to update movement requirements.

Figure 6-4: Model Settings

Note: Before executing PFE for the first time in a session, "Generate Movement Requirements" must be executed. After the first execution of "Generate Movement Requirements, the word "Generate" is changed to "Update".

All "Edit Model Settings" options are discussed in the following paragraphs. Changing a response to an item may require clicking the left mouse button on the desired answer; clicking the left mouse button on the default value, typing in another value, and pressing < RETURN> ; or clicking the left mouse button on an item and making a selection with the left mouse button from a subsequent pop-up menu.

The following parameters should only be changed before doing "Generate Requirements":

- Discard Missing Ports. When the POE and/or POD geographic location code is missing from TPFDD records and "yes" is selected for this option, the records will be ignored when generating movement requirements. When records with missing port codes are not excluded, the port information is taken from the entries made in "Edit Default Nodes" from the Situation.

- Discard Retrograde Movements. Retrograde movements are cargo and/or PAX returning from the Area of Responsibility (AOR). If retrograde movements are not ignored, PFE summary information for generating requirements and model execution will include the movement of retrograde requirements. The PFE algorithm will attempt to use a ship that is already in port, from an already scheduled POD delivery, but if a ship is not available an empty one may be dispatched to pick up the retrograde movement. If the retrograde is to be moved by air, the program assumes the pick-up and delivery can be accomplished in one day because of the speed of an aircraft, ignoring the location of the pick-up.
- On-Call Options. "Set the LAD of On-Call Units to Threshold" allows movement requirements to be generated with on-call units included in order to identify transportation required to accommodate these requirements. A "threshold" must be set to change the on-call LADs, e.g., "9999", to an actual LADs. Omit on-call units when it is not necessary to model the movement of these units.
- Use POD to Compute Missing Transportation Modes. When "yes" is selected, all requirements with missing transportation mode to POD will be designated as air or sea depending upon the installation type code of the PODs in the requirements. Records with an airport installation type will be added to the air requirements, etc. The unit is ignored if the installation type code is neither air nor sea and the "MR Report" will identify these ignored records under the label "Transportation-Mode-Couldn't-Be-Determined. If "no" is selected for this option, the unit is also ignored and the "MR Report" will label these records as "Transport-Mode-Not-Air-Or-Sea".
- Transportation Sources to Include. Clicking the left mouse button on MAC and MSC produces another pop-up window with a list of thirteen possible transportation sources for selection. TPFDD records containing the sources selected from this list will be included in the execution of "Generate Requirements". Transportation source is treated independently of transportation mode, even though there are a number of illogical pairs that can be selected. When incompatible mode and source pairs are specified for inclusion, the requirements will be ignored.
- Transportation Modes to Include. Click the left mouse button on Air and Sea and select any number of transportation modes from a pop-up list of eight possible modes that exist in the TPFDD. Include or exclude mode(s) that correspond to modes of transportation to be used in generating movement requirements. Land requirements are ignored, regardless of the selections made. Other requirements are set to air or sea mode depending on the POD (see Use POD to Compute Missing Transportation Modes). As a reminder, when incompatible mode and source pairs are specified for inclusion, the resulting movement will be zero.
- Send Non-Air PAX Requirements by Air. When a TPFDD requirement has PAX moving by sea, a yes response will count the PAX as moving by air. This will increase the number of air requirements to be moved and may require more aircraft to be allocated. Also, when non-air PAX are moved by air the number of air PAX reported after

movement requirements are generated will probably exceed the reported number of MAC PAX reflected in the TPFDD Requirements summary.

- Aircraft Earliest Embarkation Date. When ALD is selected, the model will compute movement from the POE based on the ALD of the requirement(s). In this case, the model may violate (arrive earlier than) the EAD. If EAD is selected, the model will delay movement of the requirement so it will arrive at the POD on or after the EAD.

The following parameters can be changed at any time before doing "Run PFE".

- Transportation Modes to Simulate < Sea Simulation/Air Simulation> . Sea Simulation will simulate only the PFE requirements considered as "sea", and selection of Air Simulation will model only the PFE requirements considered as "air".

Note: Just as there can be an illogical combination of mode and source, specifying Transportation Modes to Include < Air> before generating requirements and subsequently executing the Sea Simulation will produce null results.

- Simulation Stop Day. PFE will simulate movement up to the C-Day specified as "stop day". However, the model will not provide information on movements past C-120.
- Use Notional Ports. A "no" response will allow the model to use the actual ports specified in the TPFDD. When "notional" ports are selected, all actual ports are aggregated, based on notional ports assigned in the Situation, into multiple "nodes" that provide an arbitrary location as an artificial onload and offload location. Transportation assets can be used more efficiently if the requirements are aggregated to a select few onload and offload locations.
- Minimum Ship Loading Fraction before Launching. Specify a factor for the Minimum Ship Loading Fraction (MSLF) before Launching. This factor will be used to determine the number of days the ship can remain in port waiting for additional requirements. A ship can only be delayed a certain number of days in an attempt to meet load requirements, before it must sail to meet delivery schedules. Consequently, a partially loaded ship, or a ship loaded with less than the fraction specified in this setting, may have to sail to make a delivery on time. The following table illustrates how PFE calculates a launch date using an MSLF of .75.

DAYS Since
Start of Load

0-1

Launch if at least 98% full.

2-3	Launch if at least MSLF full (e.g., $\geq 75\%$).
4	Launch if at least MSLF/2 full (e.g., $\geq 37.5\%$).
5	Launch if at least MSLF/3 full (e.g., $\geq 25\%$).
6-10	Launch if at least 10% full.
> 10	Launch if the ship is not totally empty.

Note: This algorithm is new and suggestions are solicited on how to bring the algorithm closer to the realities of transporting.

- **Simulation Trace Options:** Should the Trace Info be Displayed. The system provides a trace window of information while generating movement requirements and during model execution. However, only when the response is "yes" is detailed trace and status information displayed. The trace window was originally displayed only to provide information to the developer, but it has been retained in the system because it was found to be useful for other applications.

6.3.3 Movement Requirements

Requirements from the TPFDD are aggregated into air and sea movements and converted to PFE-readable format with the "Generate Requirements" function. If the "Generate Requirements" option was performed previously, the button will read "Update Requirements". When any of the options in the top portion of the "Edit Model Settings" pop-up are changed, this option must be executed to update movement requirements. (See Paragraph 6.3.2.).

To generate requirements, click the left mouse button on "Generate Requirements". The trace screen will appear as a pop-up window with air and sea simulation information. When the trace window completes processing of the simulation and "Ready" appears in the status line, click the left mouse button on the white square (kill button) in the upper right corner of the trace screen to remove the screen from view.

While generating movement requirements, PFE does not currently make any attempt to move PAX and cargo together. However, this may happen fortuitously.

In a day-by-day process, PFE sorts air movement requirements into groups based on the ALD of the requirement, and then sorts the units each day by LAD, ALD, EAD, RDD, POE, COMMODITY-TYPE, SERVICE, and UNIT-TYPE-CODE. In addition, the model uses a single preference list when aircraft of different types are available on the same day: lower delay-penalty values go with aircraft types higher on the preference list. Finally, PFE does not parameterize aircraft payload capacity by commodity-type.

Patterns in ship allocation and movement closure dates are decided by the ALD and then LAD sort order of movement requirements. By looking at earlier ALDs first, PFE tends to favor increased ship utilization over faster closure, since (1) a ship in port can accumulate cargo that becomes available to load later, but not earlier, than the day it arrives in port, and (2) ships are

scheduled to arrive in port on or after the ALD of the first requirement to be loaded on that ship. Ships will remain at the POE until fully loaded, or until a certain number of days have elapsed with no loading activity. (The Minimum Ship Loading Fraction before Launching option is discussed in "Edit Model Settings". (See Paragraph 6.3.2.) Similarly, the unload time at a POD depends on how much cargo the ship is carrying when it arrives there.

When the update process is complete, totals of tons and PAX for air and sea requirements are available in the Movement Requirements portion of the Model panel, shown in Figure 6-5. The "MR Report" can now be viewed or printed to identify warnings and errors that may impact model results. See Section 8 for additional information on model reports.

Figure 6-5: Update Requirements/MR Report

6.3.4 Run PFE

At this point in processing, a TPFDD has been loaded, a situation selected and modified, options in "Edit Model Settings" have been addressed, and "Generate Requirements" has been run. PFE is executed by highlighting and clicking the left mouse button on the "Run PFE" option on the Model panel, shown in Figure 6-6. During processing a trace window is displayed on the screen. When processing is complete, and "Ready" appears in the status line, the trace window can be reviewed, and then removed from the screen by clicking the left mouse button on the white square (kill button) in the upper right corner of the trace window. Summary information for total air and sea (as applicable) tons, PAX, and CBBLs delivered on time, late, and never appears in the "Run PFE" window.

*Figure 6-6: Run PFE***6.3.5 PFE Results**

PFE uses the same output analysis graphs provided for RAPIDSIM, accessed by clicking the left mouse button on the Results icon, on the DART Main Icon Bar, and selecting a graph from pop-up list of graph types. See Section 7 for details of model output graphs.

In addition to the standard analysis output graphs, PFE provides an enhanced capability for model analysis, data modification, and model execution, from a Timeline window. The "PFE Force Module Timeline Display" and four additional Main Menu Bar functions are provided through the Timeline button displayed in the Main Icon Bar. The Timeline button appears on the icon bar as soon as "Generate Requirements" has been completed using the PFE model.

The "PFE Force Module Timeline Display", shown in Figure 6-7, is used to visualize the transportation closure, by FM and by units, accomplished in the last PFE simulation and to view or change parameters of the TPFDD FMs and/or requirements in preparation for subsequent model simulations.

The "PFE FM Timeline Display" appears on the bottom half of the DART screen. The Timeline display reflects a variety of information. The FM names are on the left of the display, and the arrow symbols at the top and bottom of the bar to the left of the names can be used with the left mouse button to move the display up or down. When a FM is "opened", using methods discussed below, all of the units (ULNs/CINs/PINs) associated with the module are displayed under the module name. The actual timeline for each module and unit has multiple parts:

- The orange vertical bar represents the POE.
- The yellow outline represents the POD.
- The turquoise vertical bar represents the Destination.
- A gray transportation line represents mixed transportation.
- A blue transportation line represents air transportation.
- A green transportation line represents sea transportation.
- A white bar shows closure. Requirement is on-time.
- A red bar shows closure. Requirement is late.

Figure 6-7: PFE FM Timeline Display

When the entire line of a FM, ULN, CIN, or PIN is highlighted on the display, the following information is displayed in the Mouse Information Panel:

FM - FM name	ULN - ULN number
- Total tons	- Mode
- Total PAX	- Status
- Total number of requirements	- Total tons and PAX
- FM title and date/time created.	- Unit name.
PIN - PIN number	CIN - CIN number
- Mode	- Mode
- Status	- Status
- Total tons and PAX	- Total tons and PAX
- Identification of "filler personnel" or "replacement".	- Resupply type.

When the time schedule line of a FM, ULN, CIN, or PIN is highlighted on the left side of the display, the following information is displayed in the Mouse Information Panel:

FM - FM name	ULN - ULN number
- Mode	- Mode
- Status	- Status
- Total tons and PAX	- Total tons and PAX
- Origin= > POE= > POD= >	- Origin= > POE= > POD= >

Destination GEOLOCcodes	Destination GEOLOC codes
- ALD/EAD/LAD/RDD	- ALD/EAD/LAD/RDD
- C-Day departed/C-Day closure.	- C-Daydeparted/C-Day arrived.
PIN - PIN number	CIN - CIN number
- Mode	- Mode
- Status	- Status
- Total tons and PAX	- Total tons and PAX
- Origin= > POE= > POD= >	- Origin= > POE= > POD= >
Destination GEOLOCcodes	Destination GEOLOC codes
- ALD/EAD/LAD/RDD	- ALD/EAD/LAD/RDD
- C-Day departed/C-Day arrived.	- C-Day departed/C-Day arrived.

When a FM is "closed", the timeline represents the extremes of the records it contains. (e.g. If any requirement is late, the closure line is red.) The timeline bars will expand or contract when dates are changed. The "C-date" key at the top of the Timeline is stationary, but does serve as a general guide to the C-date represented by the position of the bars in the chart.

Operations such as changing dates or priorities on the timeline display, can only be performed if the force module and unit information is "selected" first. The following instructions provide methods for selecting individual modules or units within modules:

Individual FMs can be selected and a white check mark will appear to the right of the FM name or transportation line. There are two methods for accomplishing "individual" selections. The first method for individual FM or unit display uses only the mouse buttons as follows:

- Click the left mouse button on one line of force module information. When a module is selected, "Ready" will appear in the Status Line and the white check mark will be displayed. If the left mouse button is clicked on another requirement when one has been previously selected, the previous requirement will be deselected. Clicking the left mouse button while holding down the shift key will deselect a currently selected requirement, or allow additional requirements to be selected.
- Click the middle mouse button to expand a FM to show all the units associated with it or, in the reverse, the middle button will close an expanded FM.

The second way to select an individual FMs is to click the right mouse button while highlighting one entry in timeline display. A pop-up menu will appear with the following three selections:

- Select Module < module name> . This option will select a highlighted FM.
- Toggle Module Expansion < module name> . This option will expand a FM to show the units associated with it or close an expanded module.
- Toggle Module Selection < module name> . Toggle selection will reverse the selection

or "unselect" previously selected force modules. If the units were displayed, they will remain in view but not be selected. This option also provides the capability to select multiple force modules, one FM at a time.

While one module is selected, units in another FM can be viewed by highlighting the desired FM and clicking the middle mouse button. This action will not "select" the additional FM but will expand it so the units will be in view.

In addition to the "PFE Force Module Timeline Display", the PFE screen provides four additional buttons on the Main Menu Bar:

- Display
- Modify Dates
- Set Status
- Run Model.

The Display option provides choices for the screen display in the "PFE Force Module Timeline Display".

- Refresh Timeline Display
- Normal Display
- Condensed Display
- Set Days to Display.

The "Set Days to Display" allows the specification of a beginning and ending date for the Timeline display. Only the specified section of the transportation schedule lines will be displayed.

Functions in Modify Dates, listed below, will change the specified dates in the selected requirements or save all changes made to the TPFDD. After dates are modified the model can be reexecuted for analysis of the impact of the date changes on closure and transportation requirements.

- Set LAD = FAD. Use this function to change the (planner specified) Latest Arrival Date to whatever the (analysis derived) Feasible Arrival Date is, in the selected requirements.

After the dates are changed, the Timeline will repaint on the screen and the transportation lines with each requirement will be posted with the dates changed.

- Reset Dates. Dates in selected requirements will be set back to what they were before any change was made to them in the current "PFE Force Module Timeline Display" session.
- Shift All Unit Dates. Results of this function are the same as the shift dates function in the TPFDD Editor. Selection of this option will provide a pop-up prompting for a number for the "days to shift selected units by". Highlight the default number (0) and press < RETURN> . Type in the desired number of days and press < RETURN> . Press OK to continue. All dates in the selected requirements will shift by the specified

number.

- Shift Unit Arrival Dates. Selection of this option will provide a pop-up prompting for a number for the "days to shift selected units by". To specify a number, highlight the default number (0) and then press < RETURN> . Type in the desired number of days, press < RETURN> , and click on OK to continue. Both the EAD and the LAD at the PODs in the selected requirements will shift by the specified number.
- Save TPFDD Changes. Changes made to requirement records during the PFE session can be saved to the basic TPFDD using this function. Once the changes have been saved to the TPFDD, the changed requirements can be viewed from other DART screens. Follow the steps listed below to use this option.
 - Run the PFE Model.
 - Select the requirements to make TPFDD changes on.
 - Change the requirement dates as needed.
 - Select the "Save TPFDD Changes" option from the Modify Dates button.
 - Go to the TPFDD Editor mode.
 - Select the Update Icon.
 - Select the "Programmed Updates" option on the menu bar.
 - Confirm that the changes should be made.

After changes have been made in the TPFDD Editor, the rollback selection in the TPFDD Editor Update mode will have no affect on the "PFE Force Module Timeline Display".

Set Status functions will change the movement priority for specified groups of units. By altering the priorities and rerunning the PFE, the effects of priorities on simulated closures may be evaluated. The priority of a specific movement requirement or for an entire FM is displayed on the right side of the "PFE Force Module Timeline Display" as a red, blue, or black ball.

The six Set Status functions are:

- Normal Priority for Selected Units (blue)
- Normal Priority for Ignored Units (blue)
- High Priority for Selected Units (red)
- High Priority for Non-Ignored Units (red)
- Ignore Selected Units. (black)
- Ignore All Unselected Units (black).

Run Model allows the PFE simulation to be executed directly from the Timeline screen. When the Run Model button is selected, the bottom half of "Edit Model Settings" pop-up is automatically displayed. See Paragraph 6.3.2 for instructions on completing the model settings options.

SECTION 7 – GRAPHS

Once a model run is finished or the user opens a previous analysis containing results, the user may proceed to display and analyze the results. This section discusses graphs derived from model runs and the Capacity mode charts. FM Operations graphs are discussed in Section 4, TPFDD Editor.

7.1 OVERALL GRAPH CONSIDERATIONS

Several features are common between all of the model results graphs. These include various options for sizing and editing graphs, and specifying data points within graphs. Useful tips are listed below:

- Graph creation may take awhile. A graph has completed creation when two small squares appear in the upper right corner of its window: the "sizing box" (at the top), and the "kill box" (beneath). The graph creation process is very sensitive; DO NOT attempt to move or resize the window before the graph creation process has completed, otherwise the graph may be disrupted. Also, minimize mouse movement during this time. Once the graph is done, the window may be moved or expanded.
- Most graphs show days increasing to the right. The time scale runs out to C+ 140 days (or other date, as set in the model parameters), however the user may zoom in to see more detail. It is recommended that the scale initially be zoomed to show no more than the first 30 or so days, since this is normally the most critical period.
- Graphs may also be scaled or zoomed vertically. When two graphs are being compared, ensure that they are scaled similarly, to avoid data misinterpretation.
- By moving the mouse to any point within the area of the graph, and clicking the right mouse button, a pop-up menu appears with options. Several of these allow improvement to the graph design prior to printing. Others, however, support further analysis.

Graphs of a single model run can be viewed either individually, or in groups of four (the four types being set by the system).

It is possible to show two graphs, from two different model runs, together. The planner must setup each TPFDD, run the model, and save the results. The choice of which results to compare is selected when a graph type is picked.

Note: When comparing results, the second analysis must already be loaded into memory.

Also, it is possible to iconify a graph from one analysis and bring it back to compare it to another.

7.2 GRAPH OPTIONS

The graphic output produced by DART in the Results and Capacity modes have similar features. Many objects on the graphs are mouse-sensitive. This means that when the user positions the mouse over a particular object on the graph, it is highlighted (outlined in white). All of the mouse-sensitive objects allow the user to click the right mouse button to activate a menu of options. Most of the mouse-sensitive objects on the graph allow the user to click the left mouse button to perform the most common operation performed on this object (based on the view of the programmer). The mouse-sensitive areas are described in the following paragraphs.

7.2.1 Mouse-Sensitive Objects – Text Objects

A click on any of the following objects activate the same operations:

- Graph title
- X-axis title
- Y-axis title
- Box containing graph key ("Edit Annotation Text" not available)
- Summary of data point or data region
- Free text previously added to graph.

A left mouse click allows the movement of the object. A right mouse click activates the following menu:

- | | |
|------------------------|---|
| ● Change Style | Allows font and size change of text (through a selection from a popup). |
| ● Delete | Deletes entity. |
| ● Edit Annotation Text | Allows the editing of the text; Get prompt, "Input String:"; Enter new annotation; note: if you press < RETURN> without entering text, original annotation is lost. |
| ● Move | Allows movement of the entity. |

7.2.2 Mouse-Sensitive — Entry in Graph Key Box

Single-clicking the left mouse on a single entry in the graph key box allows the user to revise the data symbol used to display this entity, as shown in Figure 7-1. Single-clicking the right mouse on a single entry in the graph key box activates the following menu:

- | | |
|-------------------------|---|
| ● Change Data Symbol... | Activates a window, allowing the user to change the data symbol representing the corresponding data set |
| ● Hide Data Set | Removes data set from graph. |

*Figure 7-1: Change Data Set Symbol***7.2.3 Mouse-Sensitive Objects — Point on Graph**

If the point has already been annotated, a left mouse click allows the user to drag the annotation to another point on the graph. If the point has not been annotated, a left mouse click does nothing. A right mouse click activates the following menu:

- Identify Data Point Annotates selected point with following information: Dataset Name, Heading and point on X-axis, Heading and point on Y-axis.

7.2.4 Mouse-Sensitive Objects — Entire Graph

Single-clicking the left mouse when the entire graph is highlighted, performs no action. Single-clicking the right mouse when the entire graph is highlighted, activates the following menu:

- Add Free Text...
- Crosshairs
- Edit Graph Border & Labels...
- Identify Data Set Point...
- Identify Data Set Region...
- Redraw Graph.
- Reveal Hidden Data Sets. (Only available if data set has been hidden).
- Zoom In...
- Zoom Out... (Only available if graph has already been zoomed.).

Use Add Free Text to freely place plain text on graph with or without a pointer to a place on the graph. Text is placed with crosshairs. This option also includes the capability to draw a line on the graph between a point and its text description. Since the text is not actually placed on the graph (it is shown in the view box), the result is simply a straight line, drawn on the graph. Some graphs may benefit from having a 45 degree diagonal line drawn through the data points. (Several graphs provide this automatically, but not all of them.)

Crosshairs activates a cross, which can be used to locate an X and Y value of a point on a graph. As the mouse is moved across the graph, the X value will appear on the X-axis and the Y value will appear on the Y-axis. Click the left mouse button to terminate the crosshairs.

Edit Graph Border and Labels activates a window which allows the user to edit the border attributes and labels. See Figure 7-2.

Figure 7-2: Edit Graph Borders

Identify Data Set Point activates a pop-up of data sets currently in view on the graph. Choose one, then select a point on the graph. It will be labeled with the following information:

- Dataset Name
- X-axis Heading
- Point on X-axis
- Y-axis Heading
- Point on Y-axis.

Identify Data Set Region activates a pop-up of data sets currently in view on the graph. Choose one, then designate an area on the graph with lines, using the left mouse button to change the drawing direction of the lines. When the box is complete, a pop-up window prompting the user for information about the data region to be displayed will be activated. See Figure 7-3.

Redraw Graph refreshes the graph. This may be necessary if the window is disturbed while the graph is being drawn.

Reveal Hidden Data Sets allows the user to reveal all data sets previously hidden using the "Hide Data Set" graph option. Only available if a data set has been hidden.

Zoom In allows the user to zoom in on a graph. Using left mouse button, choose one corner of rectangle, size the graph to the desired size, and click left mouse button. The graph will be redrawn to the specified size.

Zoom Out returns the graph to its original size. Only available if the graph has already been "Zoomed In".

Figure 7-3: Data Set Region Identifiers

7.3 CAPACITY MODE

When in Capacity Mode a "Graphs" button is added to the menu bar. In this mode there are

two graphs available:

- Capability vs. Requirements
- Show Port Workload and Capacity.

See the following paragraphs for details on each of these graphs.

7.3.1 Capability vs. Requirements

In addition to providing access to transportation analysis models, DART provides the capability to compare the TPFDD requirements with the daily capability of the airlift and sealift assets identified in the Situation. The Capability vs. Requirements graph provides the output of this process. The user can specify the transportation mode and cargo units to be displayed on a pop-up window activated by this selection. See Figure 7-4.

Figure 7-4: Capacity - Capability vs. Requirements

The Capacity data is calculated from the daily quantities of ships and aircraft contained in the Situation. For aircraft, the utilization rate is also used in the calculation.

The Requirements data is derived from the TPFDD. A TPFDD must be selected and loaded for this graph to be displayed, otherwise, an error may result. The values plotted are the TPFDD totals spread over their EAD-LAD window.

This graph shows only daily figures, and not cumulative. (The FM graphs in the TPFDD Editor can be used for that purpose.)

7.3.2 Show Port Workload and Capacity

This selection will display a graph which shows a comparison of the values entered in the "Cargo Amount Capacity" option ("Edit Nodes", Paragraph 5.3.2.) and the simulated deliveries and port requirements. A TPFDD must be selected and loaded, and PFE chosen as the model, before a Port Workload graph can be drawn. See Figure 7-5. See section 5.6.3.2 for more information on the Port Workload graph.

Figure 7-5: Capacity - Port Workload and Capacity

7.4 RESULTS MODE

When in Results mode a "Graphs" button is added to the menu bar which activates a pop-up of graphs accessible in this mode. These graphs are as follows:

- Standard 4
- Cumulative Closure Graphs
- Vehicle Activity Graph
- Scatter Graphs.

See the following paragraphs for details on each of these graphs.

7.4.1 Standard 4

The "Standard 4" display shows three closure graphs, air PAX, air STONs, and sea MTONs, and a Delivery Scatter graph. This four graph display is very useful to provide the initial top-level view of analysis results. The user may then investigate selected details using individual graphs. Four graphs are present on this screen and shown in Figure 7-6.

- Top left Cumulative STONs by Air
- Right Cumulative MTONs by Sea
- Bottom Left Cumulative PAX by Air
- Bottom Right Closure Day Scatter Plot.

On the scatter plot, sea deliveries are represented by green dots, and air deliveries are represented by blue dots.

7.4.2 Cumulative Closure Graphs

These graphs are line charts that compare various types of cumulative deliveries against delivery dates. These graphs can be set to show any combination of air/sea/STONs/MTONs/PAX/POL.

All Closure graphs include color-coded lines for cumulative deliveries vs:

- Available day (equivalent to ALD) (in light green).
- Platform loaded, meaning evidently the same as Leave day (in yellow).
- LAD (latest desired arrival day at POD) (in light blue).
- Closure day (the actual (predicted) arrival day at POD) (with red circles).
- Attrition (meaning attrition of cargo/PAX) (in purple). (This line is plotted as zero if no attrition factors are loaded.)

All graphs show C-Days, increasing to the right, against deliveries, increasing upwards. The time scale is often too compressed for details to be seen; the critical section(s) should be zoomed for better visibility.

The Closure Line is the key reference line; it represents (calculated) reality, and should fall before (left of) the LAD line.

- As long as the closure line comes before (left of) the LAD line, the schedule is being met; if it falls to the right of the LAD line, there is a shortfall.
- The space from it, left, to the Available day line, represents load and transit delay. Unusual space here means unusual delay.
- Space to the right of the Closure line, to the LAD line, represents arrival ahead of schedule; this could provide slack for other delayed movements.

Figure 7-6: Results - Standard 4

The two graphs for Air deliveries should show only a short delay (horizontal measure) between the three lines, since the total air times are relatively short.

The Sea graph may show a more substantial (horizontal) delay between the first and last lines, since sailing time is greater.

7.4.3 Vehicle Activity Graphs

These bar charts show daily ship and aircraft activity over the duration of the plan. The values are number of sorties, by air; and ships in use, by sea. The ship graph also includes overlapping color coded bars to differentiate between ship activities: "source to POE" (meaning pre-positioning); loading; POE-to-POD (meaning enroute); and unloading. See Figure 7-7.

Figure 7-7: Vehicle Activity Graph

7.4.4 Scatter Graphs

Scatter graphs (also called scatter plots) show each individual movement requirement (or aggregated movement requirement, in some cases) as a point; the analyst must visually identify meaningful groups of points (using the right mouse button menu options). This selection activates a pop-up containing the following options:

- Loading Scatter Graph
- Lateness Scatter Graph
- LAD vs. Closure Day.

If a graph is chosen, a window prompting the user for specifications on the contents and format of the graph appears. Single-click the left mouse button on the preferred graph parameters. Single-click the left mouse button on "Cancel" to abort the display or on "Ok" to view the specified graph.

Figure 7-8: Specify Scatter Graph Format

Intensity of color indicates the amount of cargo represented by the dot. These points are mouse-sensitive and a single left mouse click will allow DART to display the cargo makeup of the dot.

Loading Scatter Graphs are available for both air and sea loading activities, covering both APOEs and SPOEs, and show the "day ready to load (ALD)" vs the "day loaded and leaving the port". The difference between these two dates is the time spent at the port due to loading, and to any other delays. Delay here may be normal operational time, or may be excessive delay for some reason. Every movement requirement is plotted as a point. All points where the ALD is the same as the leave day, indicating no substantial delay in loading, form a straight diagonal line on the chart. All points above this line reflect delays, the higher the point above the diagonal the longer the delay. No points can be below the line (that would mean leaving before arriving). However, those movement requirements never loaded (for various reasons), and therefore never leaving, are shown as points along the lower margin. These points should be checked to determine the source of their problems.

Most points should cluster roughly parallel to the diagonal, but one or more days distance above it. The greater the distance above the diagonal, the greater the loading delay. This graph does not provide the diagonal line for reference, however one may be drawn as mentioned in Paragraph 7.2.4, Add Free Text.

Since most aircraft loading is reasonably short, most APOE points can be expected to cluster along the diagonal line. Any significant delays here are usually due to lack of air assets (or possible lack of Material Handling Equipment).

Vertical groups of points represent movement requirements arriving in port on the same date (ALD), but leaving at extended intervals later. These could indicate problems at specific ports, and should be checked.

Ship loading delays could be either lack of ships or port constraints.

Lateness Scatter Graphs plots "Days Late" against "Days Waiting to Load". These graphs show only late arrivals. The relative position of the points shows whether the lateness can be attributed to loading time, or whether other factors should be checked. These graphs are available showing air and sea movement requirements.

LAD vs Closure Day Scatter Graph charts the predicted closure day (the date of actual arrival at the POD) against the LAD (the latest desired date). Every movement requirement is plotted as one point, sea movements in green, air in blue.

This graph is available either as one of the four Quick View graphs (along with three Closure graphs noted above), or paired, showing sea and air deliveries, or individually. When included in the group of four, this chart shows all deliveries. When viewed individually, this chart may show either STONs, MTONs, or PAX deliveries, as requested.

A straight diagonal line is provided which marks the "Closure = LAD" point. All points below (and right of) this line are early; all points above (and left of) this line are late (shortfalls). Clumps of points above the line should be investigated.

It is possible to select groups of points (using the "Identify Dataset Region" option) to determine whether significant clumps of points have a common cause. Particular causes of late closures could be those noted elsewhere as shortfalls and bottlenecks.

SECTION 8 — REPORTS

DART allows the options for two standard JOPES reports, a movement requirements summary, and various RAPIDSIM detail reports. Below is the list of available reports:

- F11D
- F11E
- MR Summary
- Requirements
- Channels Report
- Detail Report
- Air Detail
- Sea Detail
- Major Units Detail
- Ship Report
- Summary Report
- Sortie Summary
- New DETONE
- DART Run Comment.

Only the F11D and F11E are completely model independent reports. The MR Summary is an available option after a model has been selected and requirements have been generated. The rest of the reports listed relate only to RAPIDSIM and are only available after the model has been run. (For more information on the RAPIDSIM unique reports, see the RAPIDSIM Users Manual.)

When a report is run in DART, it first appears in a window on the screen. Once the window appears, the buttons on the menu bar in the window can be used to search and print the report. The report can also be scrolled, using the scroll bar on the left side of the window. Clicking the left mouse button on the scroll bar will scroll down in the window. Clicking the right mouse button on the scroll bar will scroll up in the window. Holding and dragging the middle mouse button on the scroll bar will slowly scroll the window in the direction the mouse is being dragged. If the report selection does not prompt for a printer, the one specified in Set Printer Options (from the Utilities button) will be used.

8.1 F11D/F11E REPORTS

The F11D and F11E are JOPES-Standard reports which may be produced from all of the movement requirements contained in the TPFDD or from a collection (or subset) of records. Either of these reports can currently be accessed through four different methods in DART. The steps to follow for the various methods are listed below. When a sort option is not available, or not used, the report will be listed in ULNs/CINs/PINs order.

Reports Icon on DART Top Level:

- Click the left mouse button on the Reports Icon.
- Select a TPFDD using the File pop-up menu.
- Choose the F11D or F11E button.
- The report will automatically be displayed in a window.
- Browse, print, or exit the report.

Report Button in Summary Mode:

- Click the left mouse button on the Summary Icon.
- Select a TPFDD using the File pop-up menu.
- Click the left mouse button on the Reports button.
- Choose the F11D or F11E report.
- The report will automatically be displayed in a window.
- Browse, print, or exit the report.

FM Edits in TPFDD Editor:

- Click the left mouse button on the TPFDD Editor Icon.
- Select a TPFDD using the TPFDD Operations pop-up.
- Choose FM Edits button from menu bar.
- Select F11 Report from menu.
- Choose the F11D or F11E report.
- Select either Screen or Printer.
- If Printer is selected, enter printer name.
- If Screen is selected, report will automatically be displayed in a window.
- In the window -- browse, print, or exit the report.

A collection of Marked Records:

- Click the left mouse button on the TPFDD Editor Icon.
- Select a TPFDD using the TPFDD Operations pop-up.
- Select requirements with a retrieval, specifying sort order.
- Mark records to designate requirements for the report.
- Choose Marked Records button from menu bar.
- Select F11 Report from menu.
- Choose the F11D or F11E report.
- Select either Screen or Printer.
- If Printer is selected, enter printer name.
- If Screen is selected, report will automatically be displayed in a window.
- In the window — browse, print, or exit the report.

The following data is provided in the F11D and F11E reports:

- F11D Report: Force List/Movement Requirements Working Paper

- OPLAN Nr
- ULN/CIN/PIN
- CEI
- Force Description
- UIC
- ULC
- UTC
- ORIGIN
- FIC, PIC
- SVC
- PROVORG Name
- AUTH Pers, PAX
- STONs
- Loc Names: POD, DEST
- EAD, LAD, RDD
- Mode POD/DEST
- SRC
- PCD (DEST).

- F11E Report: Time-Phased Transportation Requirements List (TPTRL)

- OPLAN Nr
- ULN/CIN/PIN
- CEI
- Force Indicator (whether standard or other)
- Deployment Status
- Description
- Cargo Category/HL/CL
- SVC
- PROVORG
- ULC
- UTC
- UIC
- PCD
- APERS (Auth Pers)
- ORIG/POE/POD/DEST/ILOC; for each:
 - GEOLOC, CC, Ins
 - M/S, LD
 - RLD/ALD/EAD/LAD/RDD
- DLY, L, T

— PAX, BULK(MT/ST), OVER(), OUT(), NAT(), POL
(choice of ST or MT for above).

8.2 MOVEMENTS REQUIREMENTS SUMMARY REPORT

The Movement Requirements Summary Report is available through two methods in the DART system. This report is available only after the model run movement requirements are "generated". This report is useful for showing errors and similar problems in movement requirements. (These may be similar to the errors detected by the Routine Retrievals process.) The steps for retrieving this report are listed below.

Reports Icon on DART Top Level:

- Click the left mouse button on the Reports Icon.
- Select a TPFDD using the File pop-up menu.
- Choose a Situation using the File pop-up menu.
- Select a Model using the File pop-up menu.
- Choose the MR Summary button.
- Click left mouse button on Generate Requirements option on pop-up.
- "Kill" trace window.
- Select the number of ULNs/CINs/PINs to list for each category on report.
- The report will automatically be displayed in a window on the screen.
- Browse, print, or exit the report.

Report Button in Summary Mode:

- Click the left mouse button on the Summary Icon.
- Select a TPFDD using the File pop-up menu.
- Choose a Situation using the File pop-up menu.
- Select a Model using the File pop-up menu.
- Generate Requirements from Model Panel.
- Click the left mouse button on the Reports button.
- Choose the MR Summary report.
- Select the number of ULNs/CINs/PINs to list for each category on report.
- The report will automatically be displayed in a window on the screen.
- Browse, print, or exit the report.

Since this report is based on the results of generating movement requirements for a model to process, this report is available only after the "Generate Requirements" option has been completed. This report shows:

- Cargo summaries of TPFDD movement requirements
- TPFDD movement requirements recognized as erroneous entries (which are listed)
- Total requirements passed to RAPIDSIM.

The report states the names of the Analysis, the TPFDD (with update number), and the Situation. The report also lists the model (unique) parameters and selected options:

- Start and Stop days
- Sea mode (MTONs/STONs)
- Discard movement requirements with missing ports (Y/N).
- Omit on-call requirements (Y/N).
- Omit on-call units (Y/N).
- Use POD to compute missing transportation modes (Y/N).
- Include transportation sources (MAC/MSC).
- Include transportation modes (Air/Sea/Missing/ Land/Undef/Optional/None/In-place)
- Retain original mode of non-Air PAX (Y/N).
- Include Land mode (Y/N).

The report shows: Air and Sea requirements (number, STons, MTons, SqFt, PAX, CBbl), for:

- All TPFDD Requirements
- MAC and MSC Requirements
- TPFDD Requirements ignored and not included due to:
 - On-call
 - Non-MAC/MSC transportation source
 - Source
 - Shortfalls
 - Retrogrades.
- Total TPFDD records given to RAPIDSIM.

The report lists ReqIDs for erroneous entries, including, for example:

- No SRF Use TUCHA
- Missing Data
- Undefined Mode
- No TPSN
- Missing POD
- No TUCHA for Standard Unit
- Missing Mode
- No Cargo or PAX
- STONs No MTONs
- Changed Movement Type.

Also, a selected number of ULNs, CINs, and PINs, categorized by error types, are included in this report.

SECTION 9 — UTILITIES AND MISCELLANEOUS SYSTEM PROCEDURES

This section is oriented toward DART stand-alone users or operations in the GCCS environment from the SUN Server. Users in the GCCS client/server environment should use updated guidance provided as part of the GCCS fielding effort since DART operations can be launched from a variety of work stations. In either case, users are cautioned to coordinate with the DART or GCCS system administrator as appropriate for assistance with the options discussed in this section.

9.1 UTILITIES

DART provides a variety of system utilities which are not dependent on the basic functionalities outlined in Section 1. These functions are available by selecting the "Utilities" button on the main menu bar. A pop-up containing the following options appear:

- Refresh Screen.
- Hardcopy Window.
- Save Window to File.
- Retrieve Window from File.
- Reload DART Preferences.
- Set Printer Options.
- Import RAPIDSIM Setup.
- Self Test.
- Show Legal Notice.

These options are explained in the following paragraphs.

9.1.1 Refresh Screen

This option will repaint the screen.

9.1.2 Hardcopy Window

This option will activate a window allowing the user to specify printing parameters and the type of printer to direct the output. When the user selects "OK" a cross will appear. The user should click the left mouse button on the window to be hardcopied. An image of this window will be sent to the specified printer.

9.1.3 Save Window to File

This option allows the saving of a screen image to a file. The user can specify the name of the file the screen image should be saved to. When the user selects "OK" a cross will appear.

The user should click the left mouse button on the window to be saved to a file. This file can then be exported in a Macintosh, printed, or retrieved (See next paragraph).

Note: This option saves a screen in the same format as the Macify (color) option.

9.1.4 Retrieve Window from File

This option will paint a window containing an earlier saved screen. Be aware when using this option that this is just a picture of a screen, and none of the options are mouse-sensitive. To close this retrieved screen, place the mouse in the middle of the window and type a "q".

9.1.5 Reload DART Preferences

This option reloads user specific preferences for the current DART session. Default values for tape drive, map region, and enabling/disabling models can be specified in the preferences file. For more information on this option, contact the System Administrator.

9.1.6 Set Printer Options

This option allows the output device (printer) for printing system outputs and reports to be specified.

9.1.7 Import RAPIDSIM Setup

This option will import and convert RAPIDSIM setup files from DART Build I into DART Build III situation files.

9.1.8 Self Test

This option brings up a menu with the following options:

- RAPIDSIM end-to-end test
- Command execution time reporting.

9.1.9 Show Legal Notice

This option displays the copyright information in the lower right corner of the DART Top Level screen.

9.2 OPERATIONAL NOTES TO THE USER

- The terms "DART database" and "ORACLE database" in this manual refer to the same thing. The database management system, ORACLE, is used by DART to store TPFDD files and other supporting reference files.

- When this manual instructs you to type a string of characters, you should type exactly what is between quotation marks.
- When you encounter the prompt "a string" or "an editable string", the system is signaling you to single-click on this prompt, and then to enter the appropriate string of data/text.
- When you encounter the prompt "a number", the system is signaling you to single-click on this prompt, and then to enter a number in the appropriate range.
- You should always avoid double-clicking any mouse buttons. Stray clicks may be stored and cause unpredictable results.
- Use of the Caps Lock key while in the DART Top Level will make the workstation appear to be locked up. If this happens, simply unlock the Caps Lock key, and DART processing should proceed.

9.3 ERROR RECOVERY

If an "Error!" message appears in the middle of the status line, a system error has occurred. In the upper right of the DART main screen, above the analysis information panel, is a small picture of a mushroom. This is the Error Recovery Mushroom. Single-click the mouse on the mushroom. This should recover the current DART session. If the system does not recover, contact the DART System Administrator.

SECTION 10 — FILE TRANSFERS

This section is oriented toward DART stand-alone users or in some cases, operations in the GCCS environment from the SUN Server. Users in the GCCS client/server environment should use updated guidance provided as part of the GCCS fielding effort. In either case, users are cautioned to coordinate with the DART or GCCS system administrator as appropriate for assistance with the options discussed in this section.

In order to function as a TPFDD editor and analyzer, DART must accept from and return data to the WWMCCS computer. TPFDD data may originate on the WWMCCS computer in either the JOPEs database or as a JOPS TPHOLD file, and DART can return either a JOPS-format file or 9-track tape to the WWMCCS. In addition, this later version of DART can create transaction records which may be transferred to a JOPEs PID via the transaction editor system.

This chapter provides a general summary of the procedures by which files and tapes may be transferred between DART and WWMCCS. These procedures are meant to serve as general guidance and must be tailored to comply with local WWMCCS requirements.

Data security is an important consideration during this process — the local site WWMCCS ADP Security Officer (WASSO) must approve all transfer procedures. For further information on the JOPEs database, and access to the JOPEs environment, see the site JOPEs Functional Database Manager (FDBM).

The first requirement in performing a transfer to or from DART is to determine what media is to be used. The DART system in use will include a 9-track tape drive and a DOS-compatible floppy disk drive, and the local site may support direct connectivity between the DART system and the WWMCCS computer.

In addition to considering the transfer media used, transaction time and procedures will be affected by the nature of the TPFDD data loaded on the WWMCCS computer. The download steps will be shortened if the data already exists on a JOPS-formatted tape or file. If the TPFDD resides in the JOPEs database, significant time will be required to extract it (using the B8 function).

10.1 JOPEs TO DART FILE TRANSFER

TPFDD files are obtained from the JOPEs database in WWMCCS. DART either can be electronically connected to the WWMCCS or can be operated in a stand-alone mode with an air-gap (floppy disk or tape) data exchange with the WWMCCS computer. Procedures for importing files into DART are outlined in the following paragraphs.

10.1.1 Download TPFDD from JOPES

To access the WWMCCS the user must have a user identification and a password. The user must also have permissions to the OPLAN that will be downloaded. The user should check with the local site WASSO and Database Administrator to inquire about site and system security procedures. Note that WWMCCS files are normally in Honeywell BCD format and must be converted to ASCII before they can be accessed by the DART hardware. The conversion may be automatic, or may require use of a WWMCCS system utility. A generic example can be found in Appendix C.

Steps for Download From JOPES:

1. Log on to WWMCCS.
2. Sign on to JOPES.
3. Produce an output tape/file:
 - Select the B8 function to convert the desired TPFDD (identified by OPLAN ID) to JOPS format (reference the Joint Deployment System Users Guide, TD 18-14-1, Vol 2, 27 April 1990, pp. 417-419).
 - OR -
 - Select the F60 function, if necessary, to move the data to the type of media (tape or disk file) desired for transfer (reference the Joint Operation Planning System Force Requirements Generator (FRG) Users Manual, CSM UM 200-85, 1 June 1985, p. A38-1).
4. Media specific instructions:
 - 9-track tape:
 - Perform the BCD to ASCII conversion utility on the WWMCCS.
 - Physically transfer the JOPES output tape to the DART computer.
 - Floppy Disk:
 - Transfer the JOPS TPHOLD file to a WWS (WIS Workstation) using ETC — this should automatically convert the BCD data to ASCII.
 - Using a floppy disk, transfer the data to the DART computer via the Sun's PC-compatible floppy disk drive.
 - Direct Link/LAN (USTRANSCOM example shown):
 - Transfer the TPHOLD file from the WWMCCS to the USTC file server using the Hyperchannel software ("BFXGETO"). This will automatically perform the BCD to ASCII conversion of the file.
 - Transfer the file to the "/tpfdd" directory on the DART system.
5. See the next section for instructions on transferring the TPFDD file to the DART storage hardware and loading the TPFDD file into the DART database.

Note: Refer to Figure 10-1 for pictorial view of file transfer from JOPES to DART.

Figure 10-1: File Transfer from JOPES to DART (Download from Jopes)

10.1.2 Import TPFDD from WWMCCS Format

TPFDD data must be loaded in the DART database structure before it can be accessed in either the TPFDD Editor or Transportation Analysis subsystem of DART. Call the hotline if you need assistance.

Before a TPFDD can be loaded into the DART database from floppy disk, the user must copy the TPFDD onto the hard drive. Proceed with the following instructions (*Italics represent actual keystrokes (except in the case of xterm), press < RETURN> at the end of a command*):

- 1) Open an xterm window.
- 2) Type **cd /tmp**
- 3) In the event the TPFDD file is too large to fit on one disk (greater than 1.44 MB), the file must be split into smaller pieces on the DOS system. Each piece is then transferred, one at a time, to the DART computer, then rejoined and loaded into the Oracle database.
- 4) Proceed with the following steps for each file that needs to be copied.
 - Insert a disk in the 3.5" drive on the DOS workstation
 - Type **copy [file name] b:** (Assuming b: is the 3.5" drive being used.)
 - Insert the disk in the 3.5" drive on the Sun workstation
 - Type **fdmount**
 - Type **cp /pcfs/[file name] /tmp**
 - Type **rm /pcfs/[file name]**
 - Type **fdumount**
 - Type **eject**
 - Return to the DOS workstation, and repeat these steps until all files have been transferred.
- 5) Return to the Sun workstation and the directory where the TPFDD files are stored.
- 6) Type **cp file1 + file2 + ... /tpfdd/[TPFDD name]** (file1... are the names of the split files)
- 7) Type **rm file***
- 8) Type **dos2unix [source file name] [target file name]**
- 9) Iconify the xterm window, or type **exit** to close the window.

Once the TPFDD file has been transferred to a DART disk file, or in the event it is stored on a 9-track tape, it can be imported into the DART database using "Import TPFDD into DART

Database" from the "File" pop-up menu in DART. The graphic below represents the subsequent window, with the "Load from tape" option checked.

Figure 10-2: Load Window

To edit the data in the window:

- Single-click the left mouse button on the square to the right of the "Load from tape:" prompt if you are loading the TPFDD from 9-track tape.
- Position the mouse over an editable string next to the prompt for the name of the file containing TPFDD and single-click the left mouse button;
 - If loading from 9-track tape, enter the path and name of the intermediate file which will be written to the hard disk before the load into the Oracle database. (This file must not already exist)
 - If loading from a file already on the hard disk, enter the path and name of that file. (This file must already exist)
- Position the mouse over an editable string next to the prompt for the TPFDD name and single-click the left mouse button.
- Enter the name of the TPFDD. This field is the name the TPFDD will have in the DART database.

To proceed with the load:

- Single-click the left mouse button on "OK".

To abort the load:

- Single-click the left mouse button on "Cancel".

10.2 DART TO JOPES FILE TRANSFER

A TPFDD or transaction file can be uploaded back to the JOPES database after it has been edited, modified, and analyzed in the DART environment.

10.2.1 Export TPFDD to WWMCCS Format

Selection of "Export TPFDD from DART Database" from the "File" pop-up menu allows the transfer of TPFDD data stored in the Oracle database to a file on the DART storage hardware or to a 9-track tape.

Note: If you are exporting the TPFDD to 9-track tape, you must use a 9-track tape with an internal tape label provided by WWMCCS. Also, you must write the file using the same density (BPI) as was originally used to write the tape.

After the "Export TPFDD" option is selected, DART activates a window prompting for the desired format, WWMCCS, or FAST (JFAST). If a TPFDD has already been selected using "Select TPFDD" from the "File" pop-up menu, the TPFDD name will automatically appear in the subsequent window pictured below:

Figure 10-3: Format Window

To edit the data in the window:

- The currently selected TPFDD will be displayed as the TPFDD to export. (To export a different TPFDD, click on the TPFDD name and make a selection from the subsequent pop-up.)
- A default file name will appear in the "Store into file" field. To enter the name of the output file to store the TPFDD to, position the mouse over this default name and single-click the left mouse button.
- Using the default file name, the file will be written out to the user's home directory. The user may wish to put this file in the "/tpfdd" directory.
- If you want the TPFDD to be written to tape, single-click the left mouse button on the square to the right of the "Write to tape too:" prompt.

Note: When a TPFDD is exported to tape, the TPFDD is first written to a file on the hard disk, then that file is written to tape. Therefore, a file name must be specified even if the TPFDD is being written to tape.

To proceed with the export of the TPFDD:

- Single-click the left mouse button on "OK".

To abort the action:

- Single-click the left mouse button on "Cancel".

If the TPFDD file is to be transferred to a DOS-compatible workstation, not connected to the DART computer, continue with the following procedures. (The bolded text represents actual keystrokes (except in the case of xterm), press < RETURN> at the end of a command):

- 1) Open an xterm window.
- 2) Type **cd /tpfdd**
- 3) Type **ls -al**
- 4) The TPFDD flat file should appear in the list of files.
- 5) Type **dos2unix [source file name] [target file name]**

- 6) Chances are the TPFDD file will be too large to fit on one disk, therefore this file must be split into smaller pieces. If this is true, proceed, with the following steps:
 - Type **split -750 [TPFDD name]** (This will break the large file into two or more smaller files).
 - Type **ls -al** (There should be two or more files using the naming convention xaa, xab, xac, ...)
- 7) Proceed with the following steps for each file(s) that needs to be copied.
 - Insert a DOS-formatted floppy diskette.
 - Type **fdmount**
 - Type **cp [file name] /pcfs**
 - Put as many of the required files on to the diskette as it can hold.
 - Type **fdumount**
 - Type **eject**
 - Go to the DOS workstation and insert the diskette.
 - Type **copy b:*. * \plan\[directory name]** (Assuming b: is the 3.5" drive being used.)
 - After a successful copy, type **del b:*. *** in order to re-use the same diskette.
 - Return to the DOS workstation, and repeat these steps until all files have been copied.
- 8) Iconify the xterm window, or type **exit** to close the window.
- 9) Return to the DOS workstation and the directory where the TPFDD files are stored.
- 10) Type **copy xaa + xab + xac + ... [TPFDD name]**
- 11) Type **del xa***

10.2.2 Transfer DART-Created Transaction Records to JOPEs

The TPFDD Editor allows the users to write out changes to a TPFDD performed in DART to a file. This is done in the "Update" mode of the TPFDD Editor. When the user single-clicks the left mouse button on a line in the history file, a pop-up of options is activated. The last option on this pop-up is "Upload". This option will write out the selected transaction and all earlier changes to a transaction file for subsequent processing by JOPEs software.

This file may be transferred to a DOS-compatible WWS using the 3.5" floppy disk drive on the DART system and the procedures described for transferring a TPFDD to WWMCCS. (See Paragraph 10.2.1) Once the file has been transferred to the WWMCCS (in BCD format), the JOPEs function TE may be used to process the DART created TPFDD revisions.

10.2.3 Upload File Into JOPEs

The user should have already determined the type of media to be used (i.e., 9-track tape, floppy disk, or direct link/LAN), and should have written the TPFDD file out corresponding to that choice. Note that DART files are in ASCII format and must be converted to Honeywell BCD format during or after the upload to the JOPEs database. The DART user should follow WASSO and JOPEs FDBM procedures during this operation.

Steps for Upload:

1. Media specific instructions:

- 9-track tape:
 - Transfer the tape, acquired using the procedure described in Paragraph 10.2.1, to the WWMCCS computer.
 - Perform the ASCII to BCD conversion utility on the WWMCCS.
- Floppy Disk:
 - Convert the output file to DOS format: **unix2dos [source file name] [target file name]**.
 - Copy the DOS-formatted file to a DOS-formatted floppy disk.
 - Transfer the floppy disk to the WWS.

Note: See instructions in Paragraph 10.2.1.

- Transfer the data from the WWS to a WWMCCS file (converting to BCD format) using ETC.

- Direct Link/LAN (USTRANSCOM example):
 - Transfer the file to the USTC file server using "FTP".
 - TELNET (login) to the USTC file server.
 - Transfer the file to a previously created WWMCCS file (automatically converting to BCD format).

Following the previous steps, the data is now loaded on WWMCCS in a JOPS compatible format. WWMCCS users may access the file directly, using JOPS, or import the file into the JOPES database by performing the following tasks:

2. Log on to WWMCCS.

3. Sign on to JOPES:

- Select the B3 function to load the new TPFDD file into an OPLAN file (reference the Joint Deployment System Users Guide, TD 18-14-1, Vol 2, 27 April 1990, p. 411).
- Enter the target OPLAN ID, and the tape number or WWMCCS cat/file string which contains the TPFDD.
- OR -
- Select the JOPS F60 function to access the TPFDD using JOPS software (reference the Joint Operation Planning System Force Requirements Generator (FRG) Users Manual, CSM UM 200-85, 1 June 1985, p. A38-1).

See following page for a pictorial view of file transfer from DART to JOPES.

10.3 FILE TRANSFER FROM DART TO JFAST

10.3.1 Export TPFDD to JFAST Format

If operating in the GCCS environment IMS is the most efficient means to transfer a TPFDD to JFAST. If operating in the stand-alone environment, the following applies. A TPFDD which has been manipulated in DART can be exported in a format suitable for use by the JFAST. The option to "Export TPFDD from DART Database" is on the pop-up menu activated by selecting the "File" button on the DART main menu. This will activate a window prompting the user to select either "WWMCCS Flat File" or "JFAST input format". Select "JFAST input format" and proceed.

Figure 10-4: File Transfer from DART to JOPES (Upload to JOPES)

The TPFDD, in JFAST format, will be written to the hard disk in the `"/model/fast/plan/[OPLAN name]"` directory. This directory will contain the following five files:

- `[OPLAN name]m00.new`
- `[OPLAN name]p00.new`
- `[OPLAN name]r00.new`
- `[OPLAN name]t00.new`
- `[OPLAN name]u00.new`.

which must be ported to the JFAST workstation (directly accessible via network, or floppy drive).

Note: If any of these files is of size 0, it does not need to be copied to the JFAST hardware.

These files may be written to the 3.5" floppy disk drive located on the right side of the SUN SPARCstation. The `[OPLAN name]r00.new` file may exceed the storage capacity available on the floppy drive and therefore must be broken into smaller files, ported to the DOS system and put back together into one file. This will be done using the following instructions (Italics represent actual keystrokes (except in the case of xterm), press `< RETURN >` at the end of a command):

Note: Call the hotline if you do not completely understand each of the following instructions! Files will be created and deleted, therefore caution is advised.

- 1) Open an xterm window.
- 2) Type **`cd /model/fast/plan/[OPLAN name]`** `[OPLAN name]` = > actual name of OPLAN in DART database
- 3) Type **`ls -al`**
- 4) Proceed to the next section for instructions on transferring these files to the JFAST system.

10.3.2 Transferring the TPFDD to JFAST Hardware

After following all of the steps outlined in the previous section, your TPFDD will be in a format ready to be imported into JFAST. Proceed with the following steps to copy the TPFDD files to the JFAST hardware.

- 1) If all files are smaller than 1.4 MB, skip to step 2, but chances are the `[OPLAN name]r00.new` file will be too large to fit on one disk; therefore this file must be split into smaller pieces. If this is true, proceed with the following steps:
 - Type **`split -3500 [OPLAN name]r00.new`** (This will break the large file into two or more smaller files.)
 - Type **`ls -al`** (There should be two or more files using the naming convention `xaa, xab, xac, ...`)

- 2) Proceed with the following steps for each file(s) that needs to be copied from the Sun to the JFAST machine.

Note: All files in the current directory must be copied except the large files which have been broken into smaller pieces, only the pieces must be copied.

- Insert a DOS-formatted floppy diskette.
 - Type **fdmount**
 - Type **cp [file name] /pcfs**
 - Put as many of the required files on to the diskette as it can hold.
 - Type **fdumount**
 - Type **eject**
 - Go to the JFAST workstation and insert the diskette.
 - Execute the following steps on the JFAST machine only once:
 - Type **cd \plan**
 - Type **md [directory name]** (Note: This must be 5 characters, exactly. It is suggested that it be similar to the OPLAN name.)
 - Type **copy b:.* \plan\[directory name]** (Assuming b: is the 3.5" drive being used.)
 - After a successful copy, type **del b:.*** in order to re-use the same diskette.
 - If another file must be split, follow the instructions in section 10.3.2 for this split file first, then return and repeat this subset of instructions.
 - 3) Return to the JFAST workstation and the directory where the TPFDD files are stored.
 - 4) Type **copy xaa + xab + xac + ... [OPLAN name]r00.new** (if the file had to be split)
- Note: Make sure the target file name is exactly the same as it was before the split.
- 5) Type **del xa***
 - 6) Repeat the appropriate steps for each split file.

- 7) Iconify the xterm window, or type exit to close the window.

See the JFAST system administrator or the JFAST Users Manual for instructions on loading this TPFDD into the JFAST database.